(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 2 886 418 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
14.12.2016 Bulletin 2016/50

(21) Application number: **14810368.2**

(22) Date of filing: **14.05.2014**

(51) Int Cl.:
B62B 7/06 *(2006.01)*

(86) International application number:
PCT/CN2014/077477

(87) International publication number:
WO 2014/198174 (18.12.2014 Gazette 2014/51)

(54) **CHILD CART WITH BENDABLE FRONT WHEEL ASSEMBLY**

KINDERWAGEN MIT NEIGBARER VORDERRADANORDNUNG

CHARIOT POUR ENFANT À ENSEMBLE ROUE AVANT POUVANT ÊTRE PLIÉ

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

(30) Priority: **09.06.2013 CN 201310230941**

(43) Date of publication of application:
24.06.2015 Bulletin 2015/26

(73) Proprietor: **UNITRONTECH ZHUHAI Co. Ltd.**
Zuhai City, Guangdong Province (KR)

(72) Inventor: **LIU, Xiuping**
Zhuhai
Guangdong 519015 (CN)

(74) Representative: **Westphal, Mussgnug & Partner Patentanwälte mbB**
Am Riettor 5
78048 Villingen-Schwenningen (DE)

(56) References cited:
EP-A1- 0 567 422
EP-A1- 2 495 152
CN-U- 203 332 179
GB-A- 549 836
US-B2- 6 921 102

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

EP 2 886 418 B1

Description

Field of the Invention

[0001] The invention relates to a technical field of strollers, in particular to a stroller with a bendable front wheel assembly.

Background of the Invention

[0002] Strollers, i.e. baby strollers, are strollers ridden by infants and children, and with various deploying and folding states, can be ridden when deployed, and can be reduced in size when folded, to facilitate storage and transport.

[0003] EP2495152 describes a stroller, comprising a frame, a front wheel assembly and a rear wheel assembly, the frame comprising a front foot tube, a rear foot tube, a seat tube, a drive rod and a slider, the upper end of the rear foot tube being pivoted to the slider, the lower end of the rear foot tube being fixedly connected with the rear wheel assembly, the frame having a folded state and a deployed state, and in the folded state, the slider slides upwards, and the lower end of the rear foot tube is driven by the seat tube and moves towards the front foot tube.

[0004] A stroller currently available in the market has a front wheel assembly and a front foot tube that are fixedly connected to each other with an included angle larger than 90 degrees between axes thereof, such that a frame standing function cannot be achieved after the stroller is folded, and a person has to stoop down for laying the stroller on the ground. Another kind of stroller in the market has a frame with a front foot tube and a handle tube displaceable relative to each other, so that a standing point is formed with respect to the front wheel assembly by projecting the handle tube beyond the front end of the front foot tube or projecting the front end of the front foot tube beyond the front wheel assembly. However, with these two kinds of frames for achieving standing of the stroller by projecting beyond the front end of the frame, the length of the frames cannot be reduced.

Summary of the Invention

[0005] In view of this, a technical problem to be solved by the invention is to provide a stroller with a bendable front wheel assembly that can be turned in folding of the stroller.

[0006] This problem is solved by the invention as defined in claim 1.

[0007] A stroller with a bendable front wheel assembly comprises a frame, a front wheel assembly and a rear wheel assembly, the frame comprising a front foot tube, a rear foot tube, a seat tube, a drive rod and a slider, the slider being slidably connected with the front foot tube, the lower end of the front foot tube being pivoted to the front wheel assembly, the upper end of the rear foot tube being pivoted to the slider, the lower end of the rear foot tube being fixedly connected with the rear wheel assembly, the two ends of the seat tube being pivoted to the front foot tube and the rear foot tube, respectively, the two ends of the drive rod being pivoted to the rear foot tube and the front wheel assembly, respectively, the frame having two states, a folded state and a deployed state, and the frame comprising a locking mechanism for keeping the frame in the deployed state, wherein in folding of the frame, the slider slides upwards relative to the front foot tube, and the lower end of the rear foot tube is driven by the seat tube and moves towards the front foot tube, and the drive rod drives the front wheel assembly to rotate around the pivot point with the lower end of the front foot tube.

[0008] According to one embodiment of the invention, further, during folding of the frame, the included angle between the front wheel assembly and the axis of the front foot tube becomes gradually smaller; and when the frame is in the folded state, the included angle between the front wheel assembly and the axis of the front foot tube is smaller than or equal to 90 degrees, and the front wheel assembly can form a frame standing surface.

[0009] According to one embodiment of the invention, further, the stroller further comprises a handle tube telescopically inserted in the upper end of the front foot tube.

[0010] According to one embodiment of the invention, further, the frame further comprises a transmission mechanism comprising an upper rack, a lower rack and a gear, the gear being pivoted in the front foot tube, the upper rack being fixedly connected with the lower end of the handle tube and inserted in the front toot tube and being engaged with the gear, the slider being sleeved on the front foot tube, the lower rack being engaged with the gear, a through slot being formed in the front foot tube at position where the lower rack and the gear are engaged, the upper part of the lower rack passing through the through slot and being engaged with the gear, and being located outside the front foot tube and fixedly connected with the slider, wherein during rotation of the gear, the upper rack and the lower rack move in opposite directions.

[0011] According to one embodiment of the invention, further, the locking mechanism comprises a clamp, an elastic element, a pin and an unlocking pull rod, the clamp being an integrally formed piece with two ends and being arranged in a slotted hole formed in an inner cavity of the slider, a locking hole being formed in the front foot tube on a contact surface where the front foot tube and the slider slide relative to each other and cooperating with the first end of the clamp, the elastic element being arranged in the slotted hole, the unlocking pull rod being pivoted to the slider and provided with an involute groove on the inner side, a elongate slotted hole being formed at the lower part of the slider, one end of the pin being pivoted to the second end of the clamp and the other end of the pin passing through the elongate slotted hole and being inserted into the involute groove on the inner side of the unlocking pull rod, wherein when the frame is de-

ployed in a locked state, the first end of the clamp is pushed by the elastic element and cooperates with the locking hole to restrict the front foot tube and the slider from sliding relative to each other; and when the frame is folded, the unlocking pull rod is rotated so that the radius of the curved surface of the volute groove cooperating with the other end of the pin is reduced to cause the other end of the pin to move downwards and compress the elastic element and cause the first end of the clamp to be separated from the locking hole, and the front foot tube and the slider are capable of sliding relative to each other.

[0012] According to one embodiment of the invention, further, the frame further comprises a double-safety locking device, which comprises an unlocking cross bar, a hooked plastic piece and an elastic element, the two ends of the unlocking cross bar being pivoted to the unlocking pull rod, respectively, the elastic element being pivoted to the seat tube by a pivot shaft, the hooked plastic piece being fixedly connected with the elastic element, wherein when the frame is in a fully deployed state, under the action of the elastic element, the hooked plastic piece approaches the unlocking cross bar and hooks the unlocking cross bar, and before the unlocking cross bar is lifted, the hooked plastic piece is released from the unlocking cross bar.

[0013] According to one embodiment of the invention, further, both the clamp and the slider are made of plastic material, steel or aluminum alloy.

[0014] According to one embodiment of the invention, further, the handle tube, the front foot tube, the rear foot tube, the seat tube and the drive rod are made of steel or aluminum alloy.

[0015] In the case of the stroller with the bendable front wheel assembly of the invention, during folding of the frame, rotation of the front wheel assembly around the movable pivot point with the front foot tube can be implemented continuously, so that the included angle between the front wheel assembly and the front foot tube is shortened, and the front wheel assembly forms a stroller frame standing surface to achieve the functions of enabling the stroller frame to stand and reducing the length of the folded frame; a user does not has to stoop down for placing the stroller; and meanwhile, since the folded frame is shortened, the stroller is more convenient and easier to store.

Description of the Drawings

[0016] The drawings illustrated here are intended for providing further understanding of the invention and are part of the application, and the exemplary embodiments of the invention and description thereof are used for illustrating the invention, instead of exclusively limiting the invention. In the drawings:

Figs. 1-8 are schematic diagrams of an embodiment of a stroller with a bendable front wheel assembly of the invention, wherein:

Fig. 1 is a front view in a deployed state;
Fig. 2 is a side view of the stroller in a deployed state;
Fig. 3 is a view of the stroller in a folding process state;
Fig. 4 is a view of the stroller in a deployed state;
Fig. 5 is an exploded view of a slider and a built-in locking mechanism 3;
Fig. 6 is a sectional view with a clamp inserted into a front foot tube;
Fig. 7 is a sectional view of an unlocking pull rod; and
Fig. 8 is a profile view of the clamp.

Detailed Description of the Embodiments

[0017] Referring to Figs. 1-8, the technical solution of the invention will be further described in details through the drawings and the embodiments.

[0018] Figs. 1-8 are schematic diagrams of an embodiment of a stroller with a bendable front wheel assembly of the invention. As shown in the figures, the stroller comprises a frame, a front wheel assembly 7 and a rear wheel assembly 8.

[0019] The frame comprises a front foot tube 2, a rear foot tube 4, a seat tube 5, a drive rod 6 and a slider 31. The front wheel assembly 7, the rear wheel assembly 8, the front foot tube 2, the rear foot tube 4, the seat tube 5, the drive rod 6 and the slider 31 are all provided in pairs and arranged symmetrically.

[0020] The slider 31 is slidably connected with the front foot tube 2. The lower end of the front foot tube 2 is pivoted to the front wheel assembly 7, that is, pivot holes are formed at the lower end of the front foot tube 2 and the upper end of the front wheel assembly 7, respectively, and the lower end of the front foot tube 2 is pivotally connected with the front wheel assembly 7 by a pivot shaft. The upper end of the rear foot tube 4 is pivoted to the slider 31, and the lower end of the rear foot tube 4 is fixedly connected with the rear wheel assembly 8, by way of threaded connection, buckled connection, etc.

[0021] The two ends of the seat tube 5 are pivoted to the front foot tube 2 and the rear foot tube 4, respectively. The two ends of the drive rod 6 are pivoted to the rear foot tube 4 and the front wheel assembly 7, respectively.

[0022] The frame has two states, a folded state and a deployed state. In folding of the frame, the slider 31 slides upwards relative to the front foot tube 2, and since the upper end of the rear foot tube 4 is pivoted to the slider 31, the rear foot tube 4 is caused to move upwards, and the lower end of the rear foot tube 4 driven by the seat tube 5 and moves towards the front foot tube 2.

[0023] Since the two ends of the drive rod 6 are pivoted to the rear foot tube 4 and the front wheel assembly 7, respectively, the drive rod 6 causes the front wheel assembly 7 to rotate around the pivot point at the lower end

of the front foot tube 2, wherein the rotation direction of the front wheel assembly 7 can be forward or backward, and can be designed as needed according to practical situation.

[0024] According to one embodiment of the invention, when the frame is in the folded state, the included angle between the front wheel assembly 7 and the axis of the front foot tube 2 is reduced from an angle larger than 90 degrees through folding, and the front wheel assembly 7 forms a surface on which the frame can stand.

[0025] According to one embodiment of the invention, a handle tube 1 is telescopically inserted in the upper end of the front foot tube 2.

[0026] According to one embodiment of the invention, sliding of the slider 31 could be slid relative to the front foot tube 2 manually or implemented by a transmission mechanism. The transmission mechanism comprises an upper rack 22, a lower rack 32 and a gear 21.

[0027] The gear 21 is pivoted in the front foot tube 2, and an opening is formed on the wall of the front foot tube 2 below the position where the gear 21 is pivoted, according to process need; and the upper rack 22 is fixedly connected with the lower end of the handle tube 1 by way of threaded connection, buckled connection, etc., and inserted in the front toot tube 2 and engaged with the gear 21. The front foot tube 2 is sleeved with the slider 31, and the lower rack 32 is arranged in an inner cavity of the slider 31 and fixedly connected therewith by way of threaded connection, buckled connection, etc., and engaged with the gear 21 at the opening below the position where the front foot tube 2 is pivoted to the gear 21. During rotation of the gear 21, the upper rack 22 and the lower rack 32 move in opposite directions.

[0028] When the handle tube 1 moves downwards, the slider 31 is pushed by the gear 21 and slides upwards relative to the front foot tube 2 to fold the frame, and when the handle tube 1 moves upwards, the slider 31 is pushed by the gear 21 and slides downwards relative to the front foot tube 2 to deploy the frame.

[0029] When the slider 31 moves upwards relative to the front foot tube 2, the handle tube 1 is pushed by the gear 21 and moves downwards and retracts into the front foot tube 2 to fold the frame, and when the slider 31 moves downwards relative to the front foot tube 2, the handle tube 1 is pushed by the gear 21 and moves upwards and projects out of the front foot tube 2 to deploy the frame.

[0030] According to one embodiment of the invention, the locking mechanism 3 comprises a clamp 33, a spring 35, a torsional spring 36 and an unlocking pull rod 37. The locking mechanism 3 may also be provided in pairs and arranged symmetrically.

[0031] As shown in Fig. 8, the clamp 33 is an integrally formed piece, having a first end 51 opposite to the contact surface of the front foot tube 2, and a second end 53 passing through a slotted hole on the slider 31 and being movably connected with an involute groove on the inner side of the unlocking pull rod 37. The clamp 33 is provided with a spring support portion 52 in a middle position.

[0032] According to one embodiment of the invention, the clamp 33 may also be in other shapes so as to combine with an elastic piece to form a locking structure. For example, a structure with a boss is formed, the boss serves as a supporting part of an elastic piece, and the elastic piece is arranged in the slotted hole and abuts against the boss and forces one end of the clamp 33 into a positioning hole, etc.

[0033] The first end 51 of the clamp 33 may also be additionally provided with a steel bayonet to reinforce locking strength, and the second end 53 may also be provided with a radial steel bayonet 34 passing through a elongate slotted hole on the slider 31 and being movably connected with the involute groove on the inner side of the unlocking pull rod 37, to reinforce pulling effect with rotation of the involute groove after insertion into the involute groove.

[0034] According to one embodiment of the invention, the lower rack 32 and the slider 31 may be formed integrally or connected in a buckled manner, etc.

[0035] The clamp 33 is arranged in an inner cavity of the lower rack 32 and is mounted in the slotted hole of the inner cavity of the slider 31 together with the lower rack 32, and the spring 35 is arranged between the spring supporting portion 52 of the clamp 33 and the bottom of the inner cavity of the lower rack 32. The clamp 33 may also be arranged in the slotted hole of the inner cavity of the slider 31.

[0036] The front foot tube 2 is provided with a locking hole cooperating with the first end 51 of the clamp 33 in the inner cavity of the lower rack 32.

[0037] The unlocking pull rod 37 and the torsional spring 36 are pivoted to the slider 31 by a pivot shaft, and under the action of the torsional spring 36, the unlocking pull rod 37, when in a static state, is adjacent to the rear foot tube 4; and the unlocking pull rod 37 is provided with an involute groove on the inner side, and the second end 53 of the clamp 33 passes through a elongate slotted hole on the slider 31 by means of a pin 34 and then is movably inserted into the involute groove on the inner side of the unlocking pull rod 37.

[0038] In the deployed state of the frame, under the thrust action of the spring 35, the clamp 33 cooperates with the locking hole of the front foot tube 2 to restrict the front foot tube 2 and the slider 31 from sliding relative to each other. When the frame needs to be folded, the unlocking pull rod 37 is rotated around the pivot point with the slider 31, so that the second end of the clamp 33 rotates at the distal end of the involute groove of the unlocking pull rod 37 through the pin 34 and is oriented closer to the proximal end of the involute groove of the unlocking pull rod 37, causing the first end 51 of the clamp 33 to be separated from the locking hole, so that the front foot tube 2 and the slider 31 can slide relative to each other to fold the frame.

[0039] According to one embodiment of the invention, a pull rope may also be connected at the second end of the clamp 33, and unlocking is implemented by pulling

the pull rope.

[0040] According to one embodiment of the invention, an unlocking cross bar 38 may be connected between the left and right symmetrical unlocking pull rods 37, and for the purpose of locking, the unlocking cross bar 38 can be lifted by one hand, causing the unlocking pull rods 37 to rotate such that the frame can be released from the locked state. Meanwhile, the torsional spring 36 additionally provided between the unlocking pull rod 37 and the slider 31 ensures that the unlocking pull rod 37 and the unlocking cross bar 38, when in a static state, always lean against the outer side of the rear foot tube 4 and are adjacent to the seat tube 5.

[0041] According to one embodiment of the invention, to prevent risk caused by the unlocking pull rod 37 for folding the frame unintentionally, a double-safety locking device is arranged between the unlocking cross bar 38 and the seat tube 5, and the safety locking device comprises a hooked plastic piece 39, an unlocking cross bar 38 and a spring 40; the hooked plastic piece 39 and the spring 40 together are pivoted to the seat tube 5 by a pivot shaft; the spring 40 drives the hooked plastic piece 39 to approach the unlocking cross bar 38 and hook the unlocking cross bar 38; when the frame is in a fully deployed state, under the action of the spring 40, the hooked plastic piece 39 is kept close to the unlocking cross bar 38 and hooks the unlocking cross bar 38; and before the unlocking cross bar 38 is lifted, the hooked plastic piece 39 must first be released from the unlocking cross bar 38.

[0042] According to one embodiment of the invention, further, after the unlocking cross bar 38 is lifted, the unlocking pull rod 37 is caused to rotate, so that the clamp 33 is pulled to be separated from the locking hole of the front foot tube 2, and the unlocking cross bar 38 is further pulled to cause the slider 31 to slide on the front foot tube 2 and cause the rear end of the seat tube 5 to turn upwards, so that the hooked plastic piece 39 turns upwards simultaneously; after the frame is folded, the unlocking cross bar 38 is released, and under the action of the torsional spring 36, the unlocking cross bar 38 automatically approaches the rear foot tube 4; when the frame is deployed, the handle tube 1 is lifted, and the frame relies on its gravity to cause the slider 31 to slide downwards on the front foot tube 2, and driven by the seat tube 5, the rear foot tube 4 is deployed; with deployment of the frame, the first end 51 of the clamp 33 drops into the locking hole on the front foot tube 2, and the seat tube 5 returns so that the hooked plastic piece 39 is simultaneously pressed towards the unlocking cross bar 38 and hooks the unlocking cross bar 38. According to one embodiment of the invention, the front foot tube 2 is moveably pivoted to the front wheel assembly 7; the front foot tube 2 is connected with the handle tube 1 by the transmission mechanism; the rear foot tube 4 is slidably connected with the front foot tube 2 by the slider 31; the rear foot tube 4 is moveably connected with the front wheel assembly 7 by the drive rod 6; and the rear foot tube 4 is movably connected with the front foot tube 2 by the seat tube 5.

[0043] To unlock the frame, the unlocking cross bar 38 is lifted by one hand to cause the unlocking pull rod 37 to rotate, so that the first end 51 of the clamp 33 is separated from the locking hole on the front foot tube 2, and the unlocking cross bar 38 is further lifted to pull the slider 31 to slide on the front foot tube 2 through the unlocking pull rod 37, such that the handle tube 1 fixedly connected with the upper rack 22 is caused to retract into the front foot tube 2 through transmission of the gear 21, and meanwhile when sliding upwards on the front foot tube 2, the slider 31 causes the rear foot tube 4 to move upwards, and the rear foot tube 4 is pulled by the seat tube 5 to approach the front foot tube 2; during the process in which the rear foot tube 4 moves upwards and approaches the front foot tube 2 forwards, the front wheel assembly 7 is driven by the drive rod 6 connected with the rear foot tube 4 to rotate around the movable pivot point with the front foot tube 2, so that the included angle between the front wheel assembly 7 and the axis of the front foot tube 2 is gradually reduced from a angle larger than 90 degrees, and the front wheel assembly 7 forms a surface on which the stroller frame can stand, that is, in folding of the stroller frame of the invention, not only is the frame standing surface formed, but also the shorten of the length of the frame is achieved at the handle tube end and the front wheel assembly end.

[0044] According to one embodiment of the invention, the front foot tube 2 can be divided into two parts, an upper part and a lower part of the front foot tube, which are pivoted to each other, and the lower part of the front foot tube is fixedly connected with the front wheel assembly 7.

[0045] The unlocking cross bar 38 is lifted by one hand to cause the unlocking pull rod 37 to rotate, so that the first end 51 of the clamp 33 is separated from the locking hole on the front foot tube 2, and the unlocking cross bar 38 is further lifted to pull the slider 31 to slide on the front foot tube 2 through the unlocking pull rod 37, such that the handle tube 1 fixedly connected with the upper rack 22 is caused to retract into the front foot tube 2 through transmission of the gear 21, and meanwhile when sliding upwards on the front foot tube 2, the slider 31 causes the rear foot tube 4 to move upwards, and the rear foot tube 4 is pulled by the seat tube 5 to approach the front foot tube 2; during the process in which the rear foot tube 4 moves upwards and approaches the front foot tube 2 forwards, the front wheel assembly 7 and the lower part of the front foot tube 2 are driven by the drive rod 6 connected with the rear foot tube 4 to rotate around the pivot point with the upper part of the front foot tube 2, so that the included angle between the front wheel assembly 7 and the axis of lower part of the front foot tube 2 and the axis of the upper part of the front foot tube 2 is gradually reduced from an angle larger than 90 degrees, and the front wheel assembly 7 and the lower part of the front foot tube 2 together form a surface on which the stroller frame can stand, to achieve standing of the frame and

the function of further reducing the length of the frame.

[0046] According to another embodiment of the invention, the front wheel assembly 7 is not designed in pairs, but is a single front wheel assembly; the front foot tube extends to be intersected with the front wheel assembly to divide each front foot tube into two parts, an upper part and a lower part, which are movably pivoted to each other by a pivot shaft; the front wheel assembly is fixedly connected to the lower end of the front foot tube; the lower part of the front foot tube is movably connected with the rear foot tube by a drive rod; and in folding of the frame, the drive rod drives the lower part of the front foot tube to rotate around the pivot point with the upper part of the front foot tube, and the lower part of the front foot tube forms a frame standing surface.

[0047] According to one embodiment of the invention, both the clamp 33 and the slider 31 are made of plastic material or steel. The handle tube 1, the front foot tube 2, the rear foot tube 4, the seat tube 5 and the drive rod 6 are made of steel or aluminum alloy. The front foot tube 2, the rear foot tube 4 and the handle tube 1 are integrally formed tubes.

[0048] In the case of the stroller with the bendable front wheel assembly of the invention, during folding of the frame, rotation of the front wheel assembly around the movable pivot point with the front foot tube can be implemented continuously, so that the included angle between the front wheel assembly and the front foot tube is shortened, and the front wheel assembly forms a stroller frame standing surface to enable the stroller frame to stand and reduce the length of the frame; meanwhile, driven by the gear transmission mechanism, the handle tube retracts into the front foot tube, to further shorten the folded frame, so that a user does not has to stoop down for placing the stroller; and also, since the folded frame is shortened, the stroller is more convenient and easier to store.

[0049] Finally it should be noted that the above embodiments are only intended for illustrating instead of limiting the technical solution of the invention; although the invention is described in details with reference to the preferred embodiments, a person of ordinary skilled in the art should understand that the particular embodiments of the invention can be modified without departing from the scope of the invention defined by the appended claims.

Claims

1. A stroller, comprising a frame, a front wheel assembly (7) and a rear wheel assembly (8), the frame comprising a front foot tube (2), a rear foot tube (4), a seat tube (5), a drive rod (6) and a slider (31), the slider (31) being slidably connected with the front foot tube (2), the lower end of the front foot tube (2) being pivoted to the front wheel assembly (7), the upper end of the rear foot tube (4) being pivoted to the slider (31), the lower end of the rear foot tube (4) being fixedly connected with the rear wheel assembly (8), the two ends of the seat tube (5) being pivoted to the front foot tube (2) and the rear foot tube (4) respectively, the frame having two states, a folded state and a deployed state, and the frame comprising a locking mechanism for keeping the frame in the deployed state,

   characterized in that the two ends of the drive rod (6) are pivoted to the rear foot tube (4) and the front wheel assembly (7) respectively, wherein in folding of the frame,

   the slider (31) slides upwards relative to the front foot tube (2), and the lower end of the rear foot tube (4) is driven by the seat tube (5) and moves towards the front foot tube (2), and the drive rod (6) drives the front wheel assembly (7) to rotate around the pivot point with the lower end of the front foot tube (2), so that the front foot wheel assembly (7) is bendable.

2. The stroller as claimed in claim 1, **characterized in that** during folding of the frame, the included angle between the front wheel assembly (7) and the axis of the front foot tube (2) becomes gradually smaller; and when the frame is in the folded state, the included angle between the front wheel assembly (7) and the axis of the front foot tube (2) is smaller than or equal to 90 degrees, and the front wheel assembly (7) forms a frame standing surface.

3. The stroller as claimed in claim 2, **characterized by** further comprising a handle tube (1) telescopically inserted in the upper end of the front foot tube (2).

4. The stroller as claimed in claim 3, **characterized in that** the frame further comprises a transmission mechanism comprising an upper rack (22), a lower rack (32) and a gear (21), the gear (21) being pivoted in the front foot tube (2), the upper rack (22) being fixedly connected with the lower end of the handle tube (1) and inserted in the front toot tube (2) and being engaged with the gear (21), the slider (31) being sleeved on the front foot tube (2), the lower rack (32) being engaged with the gear (21), a through slot being formed in the front foot tube (2) at the position where the lower rack (32) and the gear (21) are engaged, the upper part of the lower rack (32) passing through the through slot, and being located outside the front foot tube (2) and fixedly connected with the slider (31), wherein during rotation of the gear (21), the upper rack (22) and the lower rack (32) move in opposite directions.

5. The stroller as claimed in claim 1, **characterized in that** the locking mechanism (3) comprises a clamp (33), an elastic element (35), a pin (34) and an unlocking pull rod (37), the clamp (33) being an inte-

grally formed piece with two ends and being arranged in a slotted hole formed in an inner cavity of the slider (31), a locking hole being formed in the front foot tube (2) on a contact surface where the front foot tube (2) and the slider (31) slide relative to each other and cooperating with the first end of the clamp (33), the elastic element (35) being arranged in the slotted hole, the unlocking pull rod (37) being pivoted to the slider (31) and provided with an involute groove on the inner side, a elongate slotted hole being formed at the lower part of the slider (31), one end of the pin (34) being pivoted to the second end of the clamp (33) and the other end of the pin (34) passing through the elongate slotted hole and being inserted into the involute groove on the inner side of the unlocking pull rod (37), wherein when the frame is deployed in a locked state, the first end of the clamp (33) is pushed by the elastic element (35) and cooperates with the locking hole to restrict the front foot tube (2) and the slider (3) from sliding relative to each other; and when the frame is folded, the unlocking pull rod (37) is rotated so that the radius of the curved surface of the volute groove cooperating with the other end of the pin (34) is reduced to cause the other end of the pin (34) to move downwards and compress the elastic element (35) and cause the first end of the clamp (33) to be separated from the locking hole, and the front foot tube (2) and the slider (31) are capable of sliding relative to each other.

6. The stroller as claimed in claim 5, **characterized in that** the frame further comprises a double-safety locking device, which comprises an unlocking cross bar (38), a hooked plastic piece (39) and an elastic element (40), the two ends of the unlocking cross bar (38) being pivoted to the unlocking pull rod (37), respectively, the elastic element (40) being pivoted to the seat tube (5) by a pivot shaft, the hooked plastic piece (39) being fixedly connected with the elastic element (40), wherein when the frame is in a fully deployed state, under the action of the elastic element (40), the hooked plastic piece (39) approaches the unlocking cross bar (38) and hooks the unlocking cross bar (38), and before the unlocking cross bar (38) is lifted, the hooked plastic piece (39) is released from the unlocking cross bar (38).

7. The stroller as claimed in claim 5, **characterized in that** both the clamp (33) and the slider (31) are made of plastic material, steel or aluminum alloy.

8. The stroller as claimed in any of claims 1-7, **characterized in that** the handle tube (1), the front foot tube (2), the rear foot tube (4), the seat tube (5) and the drive rod (6) are made of steel or aluminum alloy.

Patentansprüche

1. Sport-Kinderwagen, der ein Gestell, eine Vorderradanordnung (7) und eine Hinterradanordnung (8) aufweist, wobei das Gestell ein vorderes Fußrohr (2) und ein hinteres Fußrohr (4), ein Sitzrohr (5), eine Treibstange (6) und ein Gleitstück (31) aufweist, das Gleitstück (31) gleitfähig mit dem vorderen Fußrohr (2) verbunden ist, das untere Ende des vorderen Fußrohrs (2) an der Vorderradanordnung (7) angelenkt ist, das obere Ende des hinteren Fußrohrs (4) an dem Gleitstück (31) angelenkt ist, das untere Ende des hinteren Fußrohrs (4) mit der Hinterradanordnung (8) festverbunden ist, die zwei Enden des Sitzrohrs (5) an dem vorderen Fußrohr (2) bzw. dem hinteren Fußrohr (4) angelenkt sind, das Gestell zwei Zustände hat, einen zusammengeklappten Zustand und einen aufgestellten Zustand, und das Gestell einen Verriegelungsmechanismus zum Halten des Gestells in dem aufgestellten Zustand aufweist,

   dadurch gekennzeichnet, dass die zwei Enden der Treibstange (6) am hinteren Fußrohr (4) bzw. an der Vorderradanordnung (7) angelenkt sind, wobei beim Zusammenklappen des Gestells das Gleitstück (31) relativ zum vorderen Fußrohr (2) nach oben gleitet und das untere Ende des hinteren Fußrohrs (4) vom Sitzrohr (5) getrieben wird und sich zum vorderen Fußrohr (2) hin bewegt und die Treibstange (6) die Vorderradanordnung (7) treibt, so dass sie sich um den Drehpunkt mit dem unteren Ende der vorderen Stange (2) dreht, so dass die Vorderradanordnung am Fußrohr (7) verbiegbar ist.

2. Sport-Kinderwagen nach Anspruch 1, **dadurch gekennzeichnet, dass** während des Zusammenklappens des Gestells der eingeschlossene Winkel zwischen der Vorderradanordnung (7) und der Achse des vorderen Fußrohrs (2) allmählich kleiner wird und, wenn das Gestell im zusammengeklappten Zustand ist, der eingeschlossene Winkel zwischen der Vorderradanordnung (7) und der Achse des vorderen Fußrohrs (2) kleiner oder gleich 90 Grad ist und die Vorderradanordnung (7) eine Gestellaufstandsfläche bildet.

3. Sport-Kinderwagen nach Anspruch 2, **dadurch gekennzeichnet, dass** er ferner ein Griffrohr (1) aufweist, das teleskopartig in das obere Ende des vorderen Fußrohrs (2) eingefügt ist.

4. Sport-Kinderwagen nach Anspruch 3, **dadurch gekennzeichnet, dass** das Gestell ferner einen Kraftübertragungsmechanismus aufweist, der eine obere Zahnstange (22), eine untere Zahnstange (32) und ein Zahnrad (21) aufweist, wobei das Zahnrad (21) im vorderen Fußrohr (2) angelenkt ist, die obere

Zahnstange (22) mit dem unteren Ende des Griffrohrs (1) festverbunden ist und in das vordere Fußrohr (2) eingefügt ist und mit dem Zahnrad (21) in Eingriff ist, das Gleitstück (31) hülsenmäßig am vorderen Fußrohr (2) angebracht ist, die untere Zahnstange (32) mit dem Zahnrad (21) in Eingriff ist, im vorderen Fußrohr (2) an der Position, wo die untere Zahnstange (32) und das Zahnrad (21) in Eingriff sind, eine durchgehende Aussparung ausgebildet ist, der obere Teil der unteren Zahnstange (32) durch die durchgehende Aussparung verläuft und außerhalb des vorderen Fußrohrs (2) liegt und mit dem Gleitstück (31) festverbunden ist, wobei sich die obere Zahnstange (22) und die untere Zahnstange (32) während der Drehung des Zahnrads (21) in entgegengesetzte Richtungen bewegen.

5. Sport-Kinderwagen nach Anspruch 1, **dadurch gekennzeichnet, dass** der Verriegelungsmechanismus (3) eine Klemme (33), ein elastisches Element (35), einen Stift (34) und eine Entriegelungszugstange (37) aufweist, wobei die Klemme (33) ein einstückig ausgebildetes Stück mit zwei Enden ist und in einem in einem inneren Hohlraum des Gleitstücks (31) ausgebildeten Schlitzloch angeordnet ist, ein Verriegelungsloch, das im vorderen Fußrohr (2) an einer Kontaktfläche ausgebildet ist, wo das vordere Fußrohr (2) und das Gleitstück (31) relativ zueinander gleiten und mit dem ersten Ende der Klemme (33) zusammenwirken, das elastische Element (35) in dem Schlitzloch angeordnet ist, die Entriegelungszugstange (37) am Gleitstück (31) angelenkt ist und an der Innenseite mit einer Evolventennut versehen ist, am unteren Teil des Gleitstücks (31) ein längliches Schlitzloch ausgebildet ist, ein Ende des Stifts am zweiten Ende der Klemme (33) angelenkt ist und das andere Ende des Stifts (34) durch das längliche Schlitzloch verläuft und in die Evolventennut an der Innenseite der Entriegelungszugstange (37) eingefügt ist, wobei, wenn das Gestell in einen verriegelten Zustand aufgestellt wird, das erste Ende der Klemme (33) von dem elastischen Element (35) geschoben wird und mit dem Verriegelungsloch zusammenwirkt, um das vordere Fußrohr (2) und das Gleitstück (3) daran zu hindern, relativ zueinander zu gleiten; und, wenn das Gestell zusammengeklappt wird, die Entriegelungszugstange (37) gedreht wird, so das der Radius der gekrümmten Oberfläche der Evolventennut, die mit dem anderen Ende des Stifts (34) zusammenwirkt, reduziert wird, um zu verursachen, dass das andere Ende des Stifts (34) sich abwärts bewegt und das elastische Element (35) zusammendrückt und verursacht, dass das erste Ende der Klemme (33) vom Verriegelungsloch getrennt wird, und das vordere Fußrohr (2) und das Gleitstück (31) in der Lage sind, relativ zueinander zu gleiten.

6. Sport-Kinderwagen nach Anspruch 5, **dadurch gekennzeichnet, dass** das Gestell ferner eine Doppelsicherungs-Verriegelungsvorrichtung aufweist, die eine Entriegelungsquerstange (38), ein hakenförmiges Plastikstück (39) und ein elastisches Element (40) aufweist, wobei die zwei Enden der Entriegelungsquerstange (38) jeweils an der Entriegelungszugstange (37) angelenkt sind, das elastische Element (40) durch eine Schwenkwelle am Sitzrohr (5) angelenkt ist, das hakenförmige Plastikstück (39) mit dem elastischen Element (40) festverbunden ist, wobei, wenn das Gestell in einem ganz aufgestellten Zustand ist, das hakenförmige Plastikstück (39) sich unter der Wirkung des elastischen Elements (40) der Entriegelungsquerstange (38) nähert und sich an der Entriegelungsquerstange (38) einhakt und das hakenförmige Plastikstück (39) vor Hochziehen der Entriegelungsquerstange (38) aus der Entriegelungsquerstange (38) ausgelöst wird.

7. Sport-Kinderwagen nach Anspruch 5, **dadurch gekennzeichnet, dass** sowohl die Klemme (33) als auch das Gleitstück (31) aus Kunststoff, Stahl oder Aluminiumlegierung hergestellt sind.

8. Sport-Kinderwagen nach einem der Ansprüche 1 bis 7, **dadurch gekennzeichnet, dass** das Griffrohr (1), das vordere Fußrohr (2), das hintere Fußrohr (4), das Sitzrohr (5) und die Treibstange (6) aus Stahl oder Aluminiumlegierung hergestellt sind.

Revendications

1. Poussette comprenant un cadre, un ensemble de roue frontal (7) et un ensemble de roue arrière (8), le cadre comprenant un tube de base frontal (2), un tube de base arrière (4), un tube de siège (5), une tige d'actionnement (6) et une pièce coulissante (31), cette pièce (31) étant reliée en étant mobile en coulissement au tube de base frontal (2), l'extrémité inférieure du tube de base frontal (2) étant articulée sur l'ensemble de roue frontal (7), l'extrémité supérieure du tube de base arrière (4) étant articulée sur la pièce coulissante (31), l'extrémité inférieure du tube de base arrière (4) étant reliée solidairement à l'ensemble de roue arrière (8), les deux extrémités du tube de siège (5) étant respectivement articulées sur le tube de base frontal (2) et sur le tube de base arrière (4), le cadre ayant deux états, à savoir un état replié et un état déployé, et le cadre comprenant un mécanisme de blocage permettant de maintenir le cadre à l'état déployé,
caractérisé en ce que
les deux extrémités de la tige d'actionnement (6) sont respectivement articulées sur le tube de base arrière (4) et sur l'ensemble de roue avant (7), et, lors du repliement du cadre, la pièce coulissante (31) glisse vers le haut par rapport au tube de base frontal

(2) et l'extrémité inférieure du tube de base arrière (4) est entraînée par le tube de siège (5) et se déplace vers le tube de base frontal (2), et la tige d'actionnement (6) commande la rotation de l'ensemble de roue frontal (7) autour d'un pivot avec l'extrémité inférieure du tube de base frontal (2) de sorte que l'ensemble de roue frontal (7) puisse être replié.

2. Poussette conforme à la revendication 1, **caractérisé en ce que**
au cours du repliement du cadre, l'angle compris entre l'ensemble de roue frontal et l'axe du tube de base frontal (2) diminue graduellement, et lorsque le cadre est à l'état replié, l'angle compris entre l'ensemble de roue frontal (7) et l'axe du tube de base frontal (2) est inférieur ou égal à 90° et l'ensemble de roue frontal (7) forme une surface d'appui du cadre.

3. Poussette conforme à la revendication 2, **caractérisé en ce qu'**
elle comprend en outre un tube poignée (1) inséré télescopiquement dans l'extrémité supérieure du tube de base frontal (2).

4. Poussette conforme à la revendication 3, **caractérisé en ce que**
le cadre comprend en outre un mécanisme de transmission comportant une crémaillère supérieure (22), une crémaillère inférieure (32) et un pignon (21), le pignon (21) étant articulé sur le tube de base frontal (2), la crémaillère supérieure (22) étant reliée solidairement à l'extrémité inférieure du tube poignée (1) et insérée dans le tube de base frontal (2) et venant en prise avec le pignon (21), la pièce coulissante (31) étant emmanchée sur le tube de base frontal (2), la crémaillère inférieure (32) venant en prise avec le pignon (21), une fente traversante étant formée dans le tube de base frontal (2) dans une position dans laquelle la crémaillère inférieure (32) et le pignon (21) sont en prise, la partie supérieure de la crémaillère inférieure (32) passant au travers de la fente traversante et étant située à l'extérieur du tube de base frontal (2) et reliée solidairement à la pièce coulissante (31), et au cours de la rotation du pignon (21), la crémaillère supérieure (22) et la crémaillère inférieure (32) se déplacent dans des directions opposées.

5. Poussette conforme à la revendication 1, **caractérisée en ce que**
le mécanisme de blocage (3) comprend une bride de serrage (33), un élément élastique (35), une broche (34) et un poussoir de déverrouillage (37), la bride de serrage (33) étant une pièce intégralement formée ayant deux extrémités et étant positionnée dans un trou fendu réalisé dans une cavité interne de la pièce coulissante (31), un trou de blocage étant formé dans le tube de base frontal (2) sur une surface de contact au niveau de laquelle le tube de base frontal (2) et la pièce coulissante (31) glissent l'un par rapport à l'autre et coopérant avec la première extrémité de la bride de serrage (33), l'élément élastique (35) étant positionné dans le trou fendu, la tige poussoir de blocage (37) étant articulée sur la pièce coulissante (31) et munie d'une rainure à développante sur sa face interne, un trou en forme de fente allongée étant formé au niveau de la partie inférieure de la pièce coulissante (31), une extrémité de la broche (34) étant articulé sur la seconde extrémité de la bride de serrage (33) et l'autre extrémité de la broche (34) passant au travers du trou en forme de fente allongée et étant insérée dans la rainure à développante située sur la face interne de la tige poussoir de déblocage (37), et, lorsque le cadre est déployé à l'état bloqué, la première extrémité de la bride de serrage (33) est poussée par l'élément élastique (35) et coopère avec le trou de blocage pour limiter le glissement du tube de base frontal (2) et la pièce coulissante (3) l'un par rapport à l'autre et lorsque le cadre est replié, la tige poussoir de déblocage (37) étant déplacée en rotation de sorte que le rayon de la surface courbe de la fente à développante coopérant avec l'autre extrémité de la broche (34) soit réduit pour que l'autre extrémité de la broche (34) se déplace vers le bas et comprime l'élément élastique (35) que la première extrémité de la bride de serrage (33) soit séparée du trou de blocage, et que le tube de base frontal (2) et la pièce coulissante (31) puisse glisser l'un par rapport à l'autre.

6. Poussette conforme à la revendication 5, **caractérisée en ce que**
le cadre comprend en outre un dispositif de blocage à double sécurité qui comporte une traverse de déblocage (38), une pièce en matière plastique en forme de crochet (39) et un élément élastique (40), les deux extrémités de la traverse de déblocage (38) étant respectivement articulées sur la tige poussoir de déblocage (37), l'élément élastique (40) étant articulé sur le tube de siège (5) par l'intermédiaire d'un arbre pivot, la pièce en matière plastique en forme de crochet (39) étant reliée solidairement à l'élément élastique (40), et lorsque le cadre est à l'état totalement déployé, sous l'action de l'élément élastique (40), la pièce en matière plastique en forme de crochet (39) s'approchant de la traverse de déblocage (38) et accrochant la traverse de déblocage (38), et, avant que la traverse de déblocage (38) soit levée, la pièce en matière plastique en forme de crochet (39) étant dégagée de la traverse de déblocage (38).

7. Poussette conforme à la revendication 5, **caractérisée en ce que**
la bride de serrage (33) et la pièce coulissante (31) sont réalisées en une matière plastique, en acier ou

en un alliage d'aluminium.

8. Poussette conforme à l'une quelconque des revendications 1 à 7,
caractérisée en ce que
le tube poignée (1), le tube de base frontal (2), le tube de base arrière (4), le tube de siège (5) et la tige d'actionnement (6) sont réalisés en acier ou en un alliage d'aluminium.

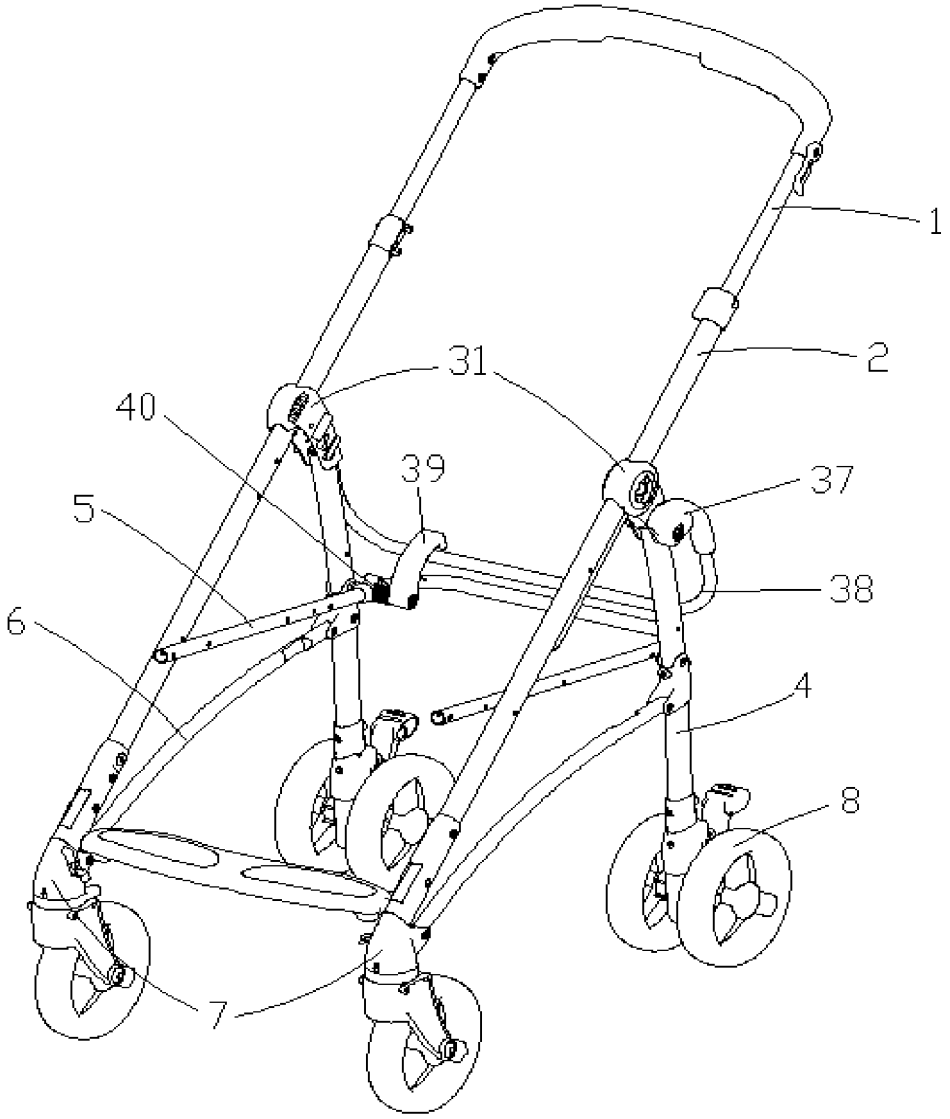


Fig. 1

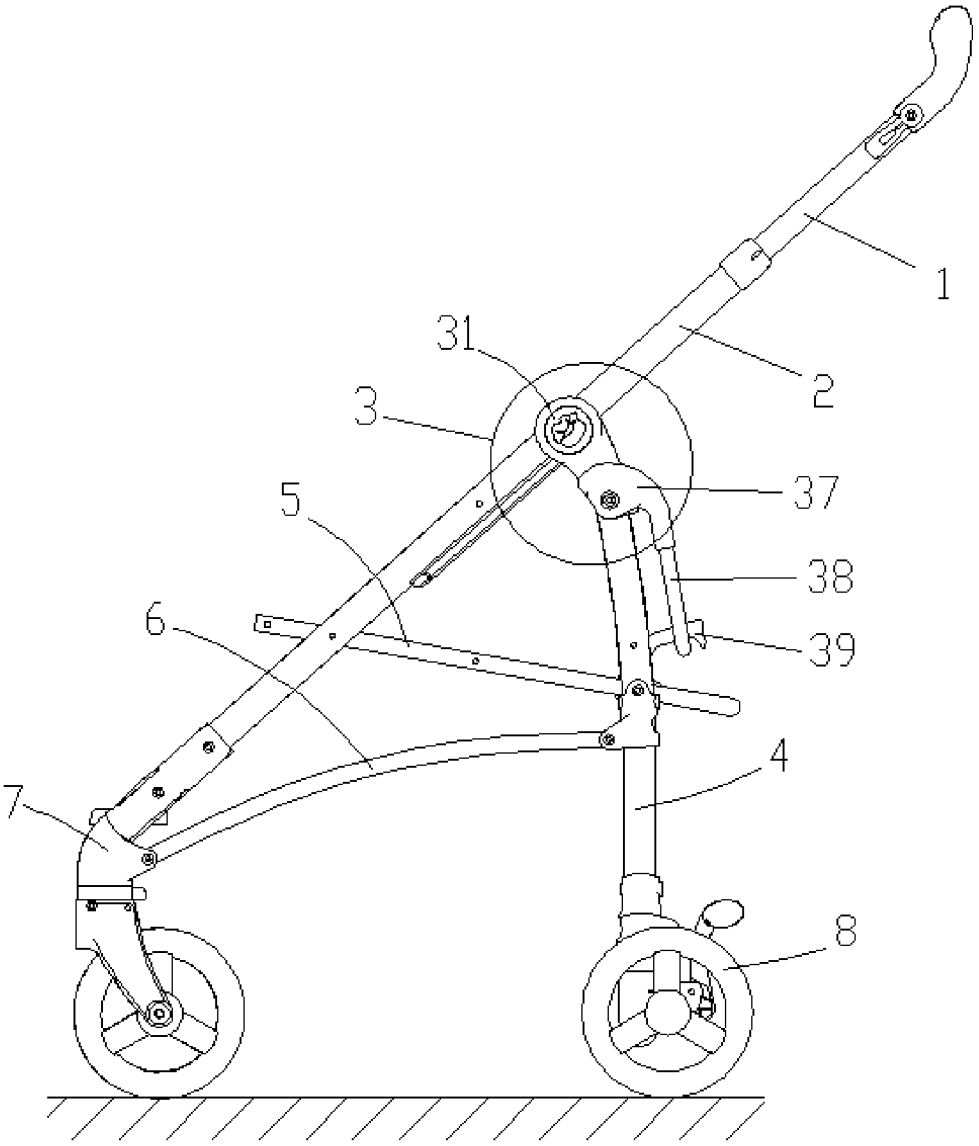


Fig. 2

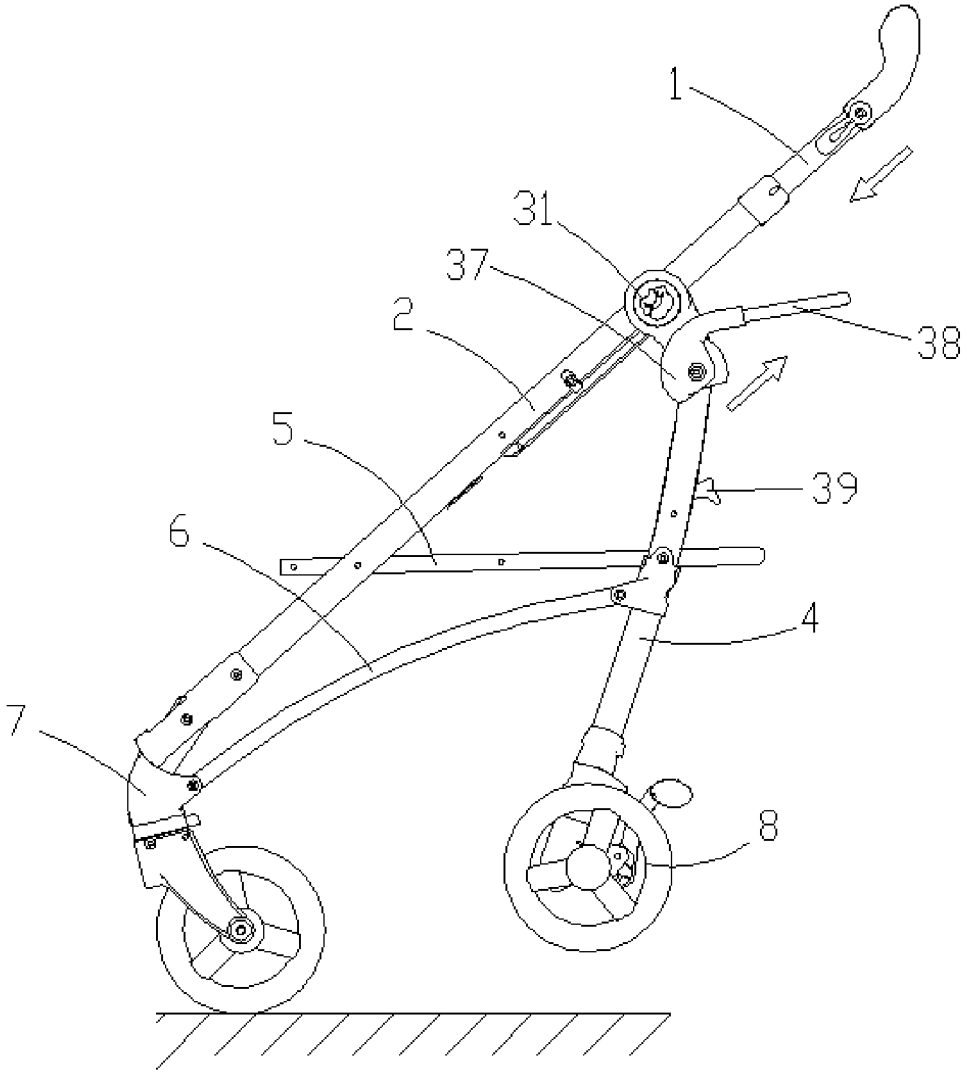


Fig. 3

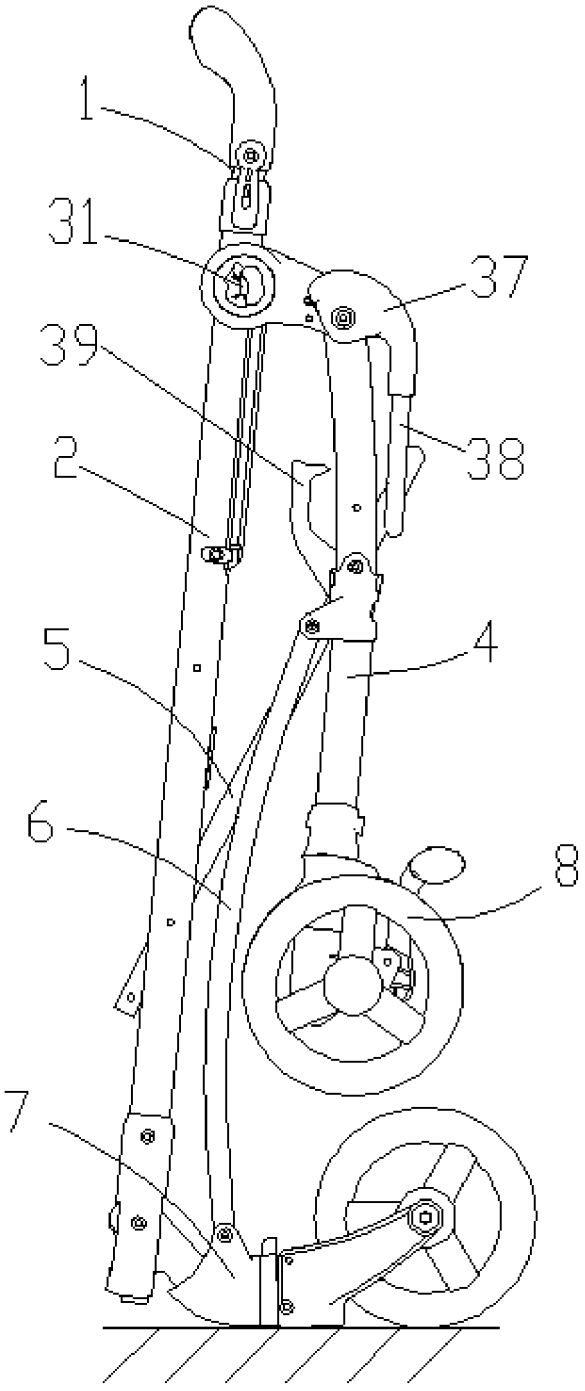


Fig. 4

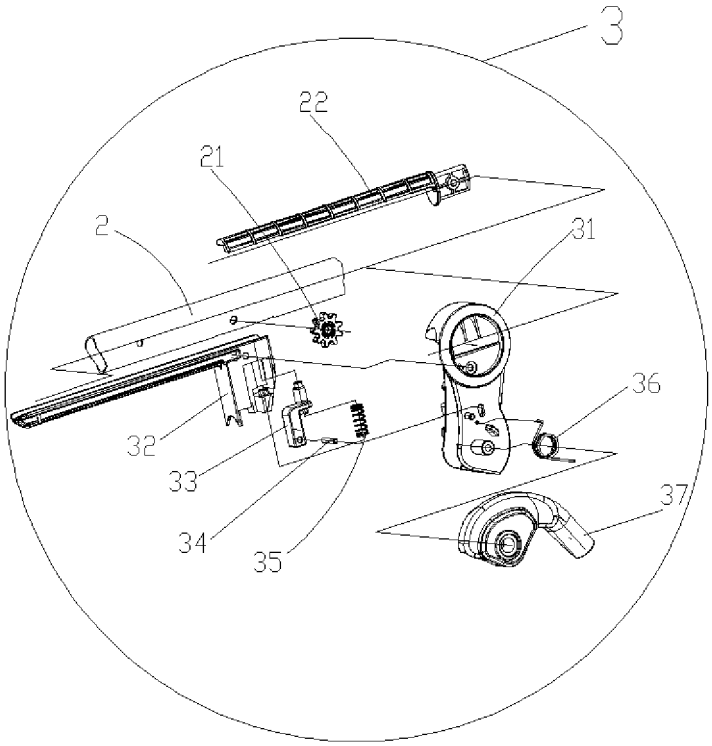


Fig. 5

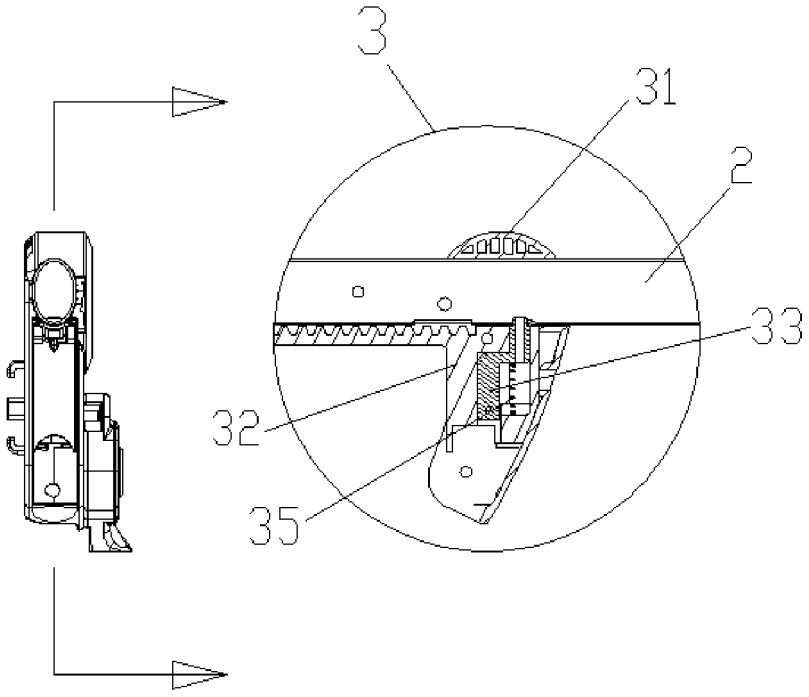


Fig. 6

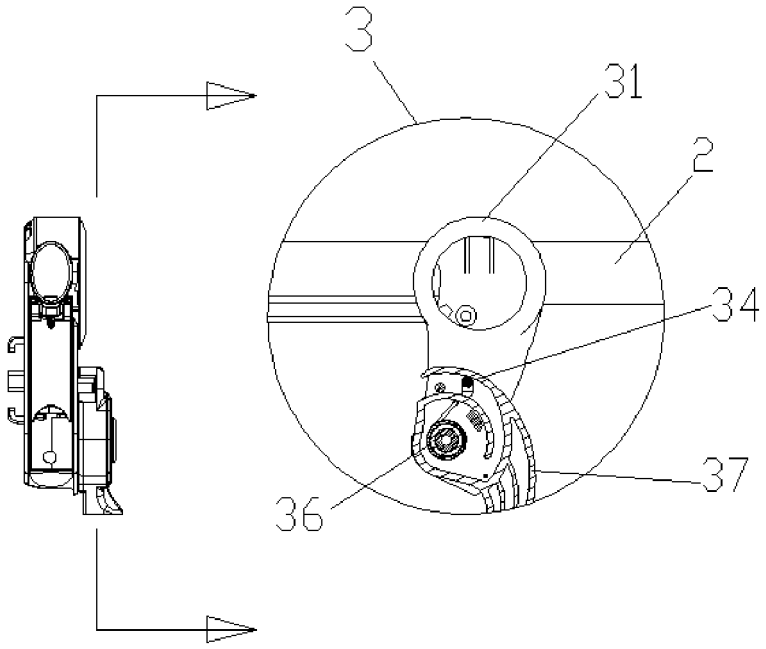


Fig. 7

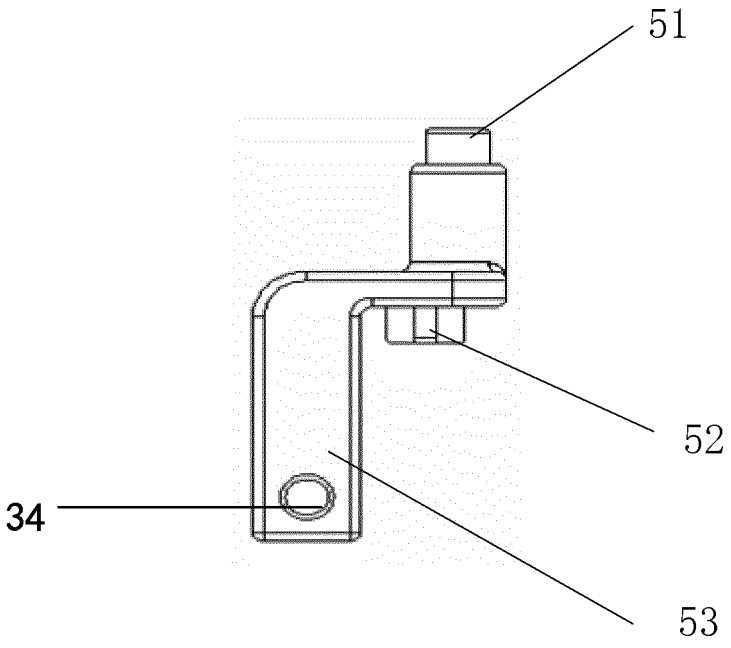


Fig. 8

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- EP 2495152 A **[0003]**